

CLAIMS

1 A speed calculation system for calculating a
communication speed of a packet that passes through a
communication path connecting a transmission node and a
5 reception node, characterized in that:

said transmission node includes:

a grouping means for grouping at least two of
its received packets; and

a transmission means for affixing probe
10 information for uniquely identifying said grouped packet
group to each packet of the packet group, and
consecutively transmitting the packets, belonging to an
identical packet group; and

said reception node includes:

15 a receiving means for receiving said transmitted
packet;

a recording means for recording an arrival time
of said received packet;

a determining means for determining whether the
20 probe information is included in said received packet; and

a calculating means for calculating a
communication speed based upon a difference between the
arrival times of the packets, belonging to an identical
packet group as identified by the probe information,
25 among the packets determined to have said probe

information included.

2 The speed calculation system according to claim 1,
characterized in that, in a case where said communication
5 path is plural, said transmission means includes further a
selecting means for selecting one path from among said
plurality of said communication paths.

3 The speed calculation system according to claim 2,
10 characterized in that said selecting means selects the
communication path of which a communication load is small
from among said plurality of said communication paths.

4 The speed calculation system according to claim 1,
15 characterized in that said calculating means is a
calculating means for dividing a total bit number of the
packets except the packet that arrived firstly, out of the
packets, belonging to an identical packet group as
identified by the probe information , by a difference
20 between the arrival times, thereby to calculate the
communication speed.

5 The speed calculation system according to claim 1,
characterized in that said transmission node further
25 includes a means for generating one dummy packet in a case

where, after receiving one packet, the next packet is not received within a predetermined time.

6 The speed calculation system according to claim 1,
5 characterized in that said transmission node further includes a means for generating at least two dummy packets in a case where the packet is not received within a predetermined time.

10 7 A node of a calculation system for, from a difference between arrival times of consecutively transmitted packets, calculating a speed of the packet, characterized in that said node is a transmission node and this node includes:

15 a grouping means for grouping at least two of its received packets; and

a transmission means for affixing probe information for uniquely identifying said grouped packet group to each packet of the packet group, and consecutively transmitting the packets, belonging to an identical packet group.

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8 The node according to claim 7, characterized in that, in a case where a communication path is plural, said transmission means further includes a selecting means for selecting one path from among said plurality of said
25 communication paths.

9 A node of a calculation system for, from a difference between arrival times of received packets, calculating a speed of the packet, characterized in that said node is a reception node and this node includes:

a receiving means for receiving the packet;

a recording means for recording the arrival time of said received packet;

a determining means for determining whether probe information is included in said received packet; and

a calculating means for calculating a communication speed based upon a difference between the arrival times of the packets, belonging to an identical packet group as identified by the probe information, among the packets determined to have said probe information included.

10 A speed calculation method for calculating a speed of a packet that passes through a communication path connecting a transmission node and a reception node, characterized in including:

a grouping step of grouping at least two of its received packets;

a transmission step of affixing probe information for uniquely identifying said grouped packet group to each packet of the packet group, and consecutively transmitting

the packets, belonging to an identical packet group;

a receiving step of receiving said transmitted packet and causing a recorder to record an arrival time of this received packet;

5 a determining step of determining whether the probe information is included in said received packet; and

a calculating step of calculating a communication speed based upon a difference between the arrival times of the packets, belonging to an identical packet group as
10 identified by the probe information, among the packets determined to have said probe information included.

11 The speed calculation method according to claim 10, characterized in that, in a case where said communication
15 path is plural, said transmission step further includes a selecting step of selecting one path from among said plurality of said communication paths.

12 The speed calculation method according to claim 11,
20 characterized in that said selecting step is a step of making a selection so that communication loads in said plurality of said communication paths can be dispersed.

13 The speed calculation method according to claim 10,
25 characterized in that said calculation step is a step of

dividing a total bit number of the packets except the packet that arrived firstly, out of the packets, belonging to an identical packet group as identified by the probe information, by a difference between the arrival times,
5 thereby to calculate the communication speed.

14 The speed calculation method according to claim 10, characterized in further including a step of generating one dummy packet in a case where, after receiving one
10 packet, the next packet is not received within a predetermined time.

15 The speed calculation method according to claim 10, characterized in further including a step of generating
15 two dummy packets in a case where the packet is not received within a predetermined time.

16 A program of a speed calculation system for calculating a speed of a packet that passes through a
20 communication path connecting a transmission node and a reception node, characterized in causing:

said transmission node to function as:

a grouping means for grouping at least two of its received packets; and

25 a transmission means for affixing probe

information for uniquely identifying said grouped packet group to each packet of the packet group, and consecutively transmitting the packets, belonging to an identical packet group; and

5 said reception node to function as:

 a receiving means for receiving said transmitted packet;

 a recording means for causing a recorder to record an arrival time of said received packet;

10 a determining means for determining whether the probe information is included in said received packet; and

 a calculating means for calculating a communication speed based upon a difference between the arrival times of the packets, belonging to an identical packet group as identified by the probe information, among
15 the packets determined to have said probe information included.

17 The program according to claim 16, characterized in,
20 in a case where said communication path is plural, further causing said transmission means to function as a selecting means for selecting one path from among said plurality of said communication paths.

25 **18** The program according to claim 17, characterized in

causing said selecting means to function so as to make a selection so that communication loads in said plurality of said communication paths can be dispersed.

5 **19** The program according to claim 16, characterized in causing said calculating means to function as a calculating means for dividing a total bit number of the packets except the packet that arrived firstly, out of the packets, belonging to an identical packet group as
10 identified by the probe information, by a difference between the arrival times, thereby to calculate the communication speed.

20 The program according to claim 16, characterized in
15 further causing said grouping means to function as a means for generating one dummy packet in a case where, after receiving one packet, the next packet is not received within a predetermined time.

20 **21** The program according to claim 16, characterized in further causing said grouping means to function as a means for generating two dummy packets in a case where the packet is not received within a predetermined time.

25 **22** A program of a node in a calculation system for, from

a difference between arrival times of consecutively transmitted packets, calculating a speed of the packet, characterized in, in a case where said node is a transmission node, causing said node to function as:

5 a grouping means for grouping at least two of its received packets; and

 a transmission means for affixing probe information for uniquely identifying said grouped packet group to each packet of the packet group, and consecutively transmitting
10 the packets, belonging to an identical packet group.

23 The program according to claim 22, characterized in, in a case where a communication path is plural, further causing said transmission means to function as a selecting
15 means for selecting one path from among said plurality of said communication paths.

24 A program of a node in a calculation system for, from a difference between arrival times of received packets,
20 calculating a speed of the packet, characterized in, in a case where said node is a reception node, causing said node to function as:

 a receiving means for receiving the packet;

 a recorder for recording the arrival time of said
25 received packet;

a determining means for determining whether probe information is included in said received packet; and

a calculating means for calculating a communication speed based upon a difference between the arrival times of
5 the packets, belonging to an identical packet group as identified by the probe information, among the packets determined to have said probe information included.

25 A calculation method of generating and transmitting a
10 dummy packet for calculating a speed to calculate a speed of a packet from a difference between arrival times of the dummy packets, characterized in employing the received packet as a packet for calculating the speed instead of generating said dummy packet.